

REMARKS/ARGUMENTS

The present Amendment is in response to the Final Office Action having a mailing date of November 15, 2005. Claims 1-35 are pending in the present Application. Claims 19-35 have been withdrawn.

This application is under Final Rejection. Applicant has presented arguments hereinbelow that Applicant believes should render the claims allowable. In the event, however, that the Examiner is not persuaded by Applicant's arguments, Applicant respectfully requests that the Examiner enter the Amendment to clarify issues upon appeal.

In the above-identified Final Office Action, the Examiner indicated that claims 3-17 are allowed. Applicant welcomes the Examiner's allowance of claims 3-17.

In the above-identified Office Action, the Examiner rejected claims 1, 2, and 18 under 35 U.S.C. § 102 as being anticipated by U.S. Patent Publication 2004/0179395 (Tsang). In so doing, the Examiner cited Figure 2 of the Tsang.

Applicant respectfully traverses the Examiner's rejection. Independent claim 1 recites:

1. A magnetic random access memory cell comprising:
 - a magnetic memory element having a top portion and a bottom portion, the magnetic memory element being a magnetoresistive element including a pinned layer, a free layer, and a nonmagnetic layer between the pinned layer and the free layer;
 - a first write line below the magnetic memory element, the first write line being electrically connected with the bottom portion of the magnetic memory element;
 - a second write line above the magnetic memory element, the second write line being electrically isolated from the magnetic memory element and oriented at an angle to the first write line.

Claim 2 depends upon independent claim 1 and recites:

2. The magnetic random access memory cell of claim 1 wherein the angle is ninety degrees.

Similarly, independent claim 18 recites

18. A magnetic random access memory comprising:

a plurality of magnetic memory elements, each of the plurality of magnetic memory elements having a top portion and a bottom portion, each of the plurality of magnetic memory elements being a magnetoresistive element including a pinned layer, a free layer, and a nonmagnetic layer between the pinned layer and the free layer;

a first plurality of write lines below the plurality of magnetic memory elements, a write line of the first plurality of write lines being electrically connected with the bottom portion of a corresponding magnetic memory element of the plurality of magnetic memory elements;

a second plurality of write lines above the plurality of magnetic memory elements, the second plurality of write lines being electrically isolated from the plurality of magnetic memory elements, the second plurality of write lines being oriented at an angle to the first plurality of write lines, the plurality of magnetic memory elements residing at intersections between the first plurality of write lines and the second plurality of magnetic write lines.

Thus, independent claims 1 and 18 recite a magnetic random access memory (MRAM) cell and a MRAM having cells, respectively, that include magnetic memory element(s), first write line(s) that are below and electrically connected to the magnetic memory elements, and second write line(s) that are above and electrically isolated from the magnetic memory element(s). Thus, the first and second write lines are on *opposite* sides of (above and below) the magnetic memory element. The first write line above the magnetic element is the write line that is electrically connected with the magnetic element. Furthermore, one of ordinary skill in the art would readily recognize that a structure described as being “below” another structure is typically in closer proximity to a substrate during fabrication. Thus, as in the embodiment depicted in Fig. 4 of the present application, the write (bit) line 109 is closer to the substrate 100 than the magnetic element 11. In contrast, the write (word) line 113 is farther from the substrate 100 than the magnetic element 11. Thus, the MRAM cell and MRAM recited in claims 1 and 18, respectively, may be

have improved efficiency and scalability and may be simpler to fabricate. See, Specification, Summary of the Invention.

Although Tsang functions well for its intended purpose, Tsang fails to teach or suggest a MRAM cell or MRAM in which the first write line is below and electrically coupled to the magnetic element, while the second write line is above and electrically isolated from the magnetic element. Tsang describes a magnetic memory that utilizes magnetic write lines. Tsang, Paragraph 31. In the cited portion of Tsang, Fig. 2, Tsang depicts a MRAM having a magnetic bit line 82 and a word line 83. Tsang, Fig. 2. As depicted and described, however, both the magnetic bit line 82 and the word line 83 are above the magnetic element 90. Tsang, Fig. 2 and Paragraph 31. Thus, the lines 82 and 83 are both on the same side of the magnetic element 90, rather than one being below while the other is above the magnetic element. The cited portion of Tsang thus fails to teach or suggest the structures recited in claims 1 and 18.

Fig. 1 of Tsang also fails to teach or suggest the MRAM cell and MRAM recited in claims 1 and 18, respectively. Fig. 1 of Tsang does depict a MRAM in which the write lines are on opposite sides of the magnetic element. However, the top write line 12 and in some instances the bottom write line 10, are apparently electrically connected to the magnetic element 30. Tsang, Fig. 1 and Paragraph 8. Consequently, Tsang fails to teach or suggest the use of two write lines on opposite sides of the magnetic element, with the write line below the magnetic element being electrically connected to the magnetic element while the write line above the magnetic element is electrically isolated from the magnetic element. Accordingly, Applicant respectfully submits that claims 1 and 18 are allowable over the cited references.

Claim 2 depends upon independent claim 1. Consequently, the arguments herein apply with full force to claim 2. Accordingly, Applicant respectfully submits that claim 2 is allowable over the cited references.

Applicant's attorney believes that this application is in condition for allowance. Should any unresolved issues remain, Examiner is invited to call Applicant's attorney at the telephone number indicated below.

Respectfully submitted,

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Date

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